

**International Harmonised Research Activities
Vehicle Compatibility Working Group**

Minutes of the Fifth Meeting, held at DETR, London, on 18 - 19 February 1999

Present:	P O'Reilly	Chairman	T Hollowell	USA
	A Hobbs	Secretary	P Prasad	US Industry
	K Seyer	Australia	R Zobel	European Industry
	C Newland	Australia	C Lomonaco	IHRA Frontal
	D Dalmotas	Canada	A Lie	IHRA Frontal
	E Faerber	EU/EEVC	E Gianotti	IHRA Frontal
	D Cesari	EU/EEVC	M Edwards	TRL/Observer
	Y Kadotani	Japan/Industry	L Thompson	TRL/Observer

The minutes of the fourth meeting were agreed. The choices of cars to be included in the EEVC and EUCAR test programmes are not finalised. Points arising from the minutes were covered later in the agenda.

Status Reports

USA

Dr Hollowell presented updated data on aggressivity (Docs 3b & 21). Light Trucks and Vans were shown to be more aggressive than cars, irrespective of mass. Mass was seen to have an influence within a vehicle type. SUV data is now grouped by size showing large SUVs to be more aggressive than small SUVs. A further separation was to consider vehicles produced after 1990. This has shown an improvement in crashworthiness but the same variation with respect to the striking vehicle, for all ages of vehicle (Doc 22). He also presented an analysis of load cell wall data, from US NCAP tests (Doc 23). In this analysis, linear stiffness (kN/m) was used. It was considered that the use of force might be more appropriate. This will be studied in future.

Dr Prasad did not consider that frontal stiffness was relevant in side impact. The fronts of cars are very much stiffer than the sides. In his view geometry is more important. In frontal impact, he thought that it was necessary to control the force distribution, early in the impact, to control homogeneity. He was also concerned that the forces recorded by the load cell wall were different from those seen in car to car impacts because of the inertia effects. He was concerned that the US NCAP test encouraged manufacturers to front load the deceleration curve in order to get acceptable restraint loads. He thought that this made the cars unnecessarily aggressive.

Dr Hollowell will provide details of how the force distributions in Doc 23 have been generated.

Action

EEVC

Mr Faerber described the EEVC work programme. Dr Edwards added some comments on the frontal and side impact modelling work. TNO are generating MADYMO models of the Taurus and Neon. TRL is supplementing this with FE validation runs. He went on to explain a parametric study he had performed, varying the characteristics of the European side impact barrier face, impacting a small car (Doc 24). He will, in future, look at the extent of crush of the barrier face, for different stiffnesses, at the time the injury parameters peak. **Action**

Mr Hobbs then described the EEVC test programme. It is proposed that a full width US NCAP type impact be carried out with a thin deformable face ahead of the load cell wall (Doc 25). This test is intended to identify non-homogeneous loading. In future, it may be possible to control the homogeneity of car fronts by limiting the variation in the horizontal and vertical force / time characteristics of the car front. Further control could require the a lower force at higher parts of the car front than at lower parts. This could drive car frontal stiffness down to interact better with door sills in side impact. Analysis of the interface force in car to car impacts can be compared with the load cell wall data in barrier impacts (Doc 26).

Data from these full width tests will be compared with that from car to car and car to ODB tests. For side impact, INSIA will carry out tests examining the effect of bullet vehicle height. For both frontal and side impact, some tests will be carried out with modified cars with more homogeneous fronts.

Japan

Mr Kadotani explained that a structural survey had been carried out looking at bumper geometry and longitudinal location. Consideration is being given to how this data might be analysed. He expects that an analysis of accident data will be available at a future meeting. He requested advise about how the structural data might be used in combination with accident data. Mr Hobbs suggested that he might like to refer to the paper by Ian Rogers, from Rover, which was presented to the recent ACEA/EUCAR Accident Seminar.

Canada

Mr Dalmotas explained that Canada has no specific compatibility programme but he thought that their side impact work was of relevance. They are looking at accidents to find cases of low injury severity in severe impacts and AIS\$3 injuries in minor impacts. They then plan to reconstruct the accident to investigate the validity of the side impact test.

They are also looking at side impact airbags to identify problems for children and out of position occupants. They are looking at the protection provided by head protecting airbags in impacts with LTVs. It is expected that the Canadian research over the next year to two years will concentrate on side impact. However, as the IHRA compatibility work progresses, they will look at the proposals.

Australia

Mr Seyer presented data from a survey of the structures of six cars of different sizes (Doc 27). They looked at the positions of the frontal cross beams and longitudinals in the static and braking situation and related this data to sill height.

For the next meeting Mr Seyer will update this information with details about the H point locations. He will also provide a document on fatalities and injuries in accidents. **Action**

Current accident studies are showing that there is a strong correlation with mass in frontal impact. In side impact, risk is associated with car size. The greatest risk being seen in small cars.

Mr Seyer distributed a test matrix for five side impact tests, which they expect to complete by May 1999 (Doc 28). For the future, they are also planning a frontal impact compatibility programme.

European Industry

Dr Zobel presented the position of the EUCAR group. Based on their accident data, they had grouped some factors as “compulsory” and others as “possible.” They had not been able to find any relationship between vertical or horizontal alignment of longitudinals and injury risk. Consequently, they had excluded lateral mismatch of longitudinals and the fork effect caused by lateral or vertical misalignment. Mr Hobbs explained that he was concerned that these effects has been excluded on the basis of the analyses carried out. He considered that separate horizontal and vertical analyses could not be expected to show the difference between good and poor interaction.

Dr Zobel went on to explain his “bulkhead concept” to which he added the requirement to limit passenger compartment acceleration to 30 g. He was looking at accommodating 90 percent of mass ratio impacts. Dr Prasad explained that, with state of the art structures, it took 10 -15 msec to build up to 30 g and this took about 175 mm of crush depth.

Following some further discussion, the Chairman asked if EEVC and others could consider looking at the NHTSA fleet model to see if extra data could be added. Mr Seyer will provide copies of an earlier paper with such an analysis, carried out some time ago.

US Industry

Dr Prasad explained that with Chrysler leaving AAMA, it is expected that about 6 months will pass before AAMA becomes active again. He went on to explain the Ford programme. Ford are carrying out partial and full overlap car to LTV tests. They are concentrating on frontal impact as side impact is primarily influenced by geometry. They plan to deal with side impact compatibility problems with side airbags. FE modelling is being used to support the crash test work. They are also looking at 30E offset car to car tests similar to those carried out by NHTSA. They consider that the tests are being performed at too high a speed, so they are using 60 mph. They are also looking at accident data, in the light of concerns that) v assessments are generally too low.

Dr Hollowell said that until AAMA could act together, he would offer to transmit data from GM to the IHRA group.

Japanese Industry

Mr Kadotani explained that J 208 has been expanded to cover minicars (. 800 kg) with a speed increased from 40 to 50 km/h. Some 50 km/h, 50 percent overlap car to car tests are being carried out. Minicar performance is seen as very important in Japan and is becoming a competitive area. As only some manufacturers have products in the minicar category, decision making is difficult. At the next meeting, he will aim to present some accident data on minicars. **Action**

Mr Lie commented that GM are using vehicle acceleration data from crash sensors in accidents. Dr Prasad explained that Ford could do the same but have to sort out the legal implications. In addition to speed and acceleration, there is also information about belt wearing.

ACEA/EUCAR will be deciding on their crash test programme in the next week and will then communicate it to the EEVC. **Action**

Dr Zobel agreed to supply a summary of the ACEA/EUCAR accident seminar to IHRA members.

Action

IHRA Programme Schedule

The programme schedule will be updated on the basis of revised details from the members and will be re-issued with the minutes as Doc 13c.

Co-ordination with EEVC and EUCAR

Following the EUCAR meeting, Dr Zobel will provide details of the EUCAR test programme to the secretary. The secretary will circulate copies of the EEVC and EUCAR test programmes to members. Others are requested to circulate details of their own test programmes and their objectives. **Action**

Future Outputs

The chairman considered that an intermediate output would be needed, prior to that for the ESV conference in 2001. He suggested that this might be to the Vehicle Safety 2000 conference.

prior to consideration about putting information onto the IHRA web site, Dr Hollowell will check what the position is regarding confidentiality. **Action**

Date and Place of Next Meeting

The next meeting is planned for 6 - 7 July 1999, in Berlin. It will start at lunchtime, after the EEVC WG15 meeting and will be followed by an IHRA Frontal impact meeting. The following meeting is expected to be at the time of the Stapp conference, in the USA. The dates are expected to be 28-29 October 1999.

C A Hobbs
29 March 1999